

expressed in the prefatory quotation from Sir J. F. W. Herschel:—"To the Natural Philosopher there is no natural object that is unimportant or trifling; from the least of Nature's works he may learn the greatest lessons."
J. A. T.

THE WASTAGE IN ARMIES BY DISEASE.

THE recent utterances of Sir Frederick Treves on the subject of the Army Medical Service (see NATURE, November 2, p. 15), and the discussion on enteric fever in the army which has appeared in the columns of the *Times*, have again directed attention to the inadequacy of the means taken in our army to prevent the incidence of enteric fever and other filth diseases. The crux of the matter is this: we have to provide hospital accommodation for 10 per cent. of our forces in the field, the Japanese for but 2 per cent. Why this difference? In the South African campaign no less than 746 per 1000 of the fighting forces were admitted into hospital for disease which is mainly preventable. In this war there were something like 450,000 admissions to hospital on account of sickness and some 22,000 admissions on account of wounds or injuries received in action.

"Among those admitted to hospital on account of disease alone, there were 14,800 deaths during the whole war; further, so far as can be estimated at present, 42,741 of the total admissions to hospital on account of disease, and 7998 of the deaths from disease, were due to enteric fever, while 31,363 of the admissions and 1248 of the deaths were from dysentery. In other words, no less than one-tenth of the admissions on account of disease were for enteric fever, and one-fourteenth were for dysentery, or these two diseases alone were the cause of practically one-sixth of the total admissions and about two-thirds of the total deaths on account of disease; these two diseases also accounted for nearly one-half of the total losses by death from all causes during the war. As we know that both enteric and dysentery belong to the group of diseases which are largely the outcome of faulty environment, the sanitary significance of these figures needs no argument."¹

How does the Japanese Army deal with the prevention of disease? The following record sufficiently answers this question:—

"The care of the sick and wounded occupied but a small share of the time of the medical officers. The solution of the greater problem of preventing disease by the careful supervision of the smallest details of subsistence, clothing and shelter was their first and most important duty. Nothing was too small to escape their vigilance, nor too tedious to weary their patience, and everywhere, in the field with the scouts or in the base hospitals at home, the one prevailing idea was the prevention of disease. The medical officer was to be found both in the front and in the rear. He was with the first screen of scouts, with his microscopes and chemicals, testing and labelling wells, so that the army which followed should drink no contaminated water. When scouts reached a town, he immediately made a thorough examination of the sanitary conditions, and if cases of contagious or infectious disease were found, he put a cordon around the quarter where they were. A medical officer accompanied foraging parties, and, with the commissariat officers, sampled the various food, fruit, and vegetables sold by the natives before the arrival of the army. If the food were tainted, or the fruit over-ripe, or if the water required boiling, notices to that effect were posted in suitable places. So strict was the discipline from commanding officer to rank and file that obedience to the orders of the medical officer was absolute. The medical officer also supervised the personal hygiene of the camp. He taught the men how to cook, how to bathe, how to cleanse the finger nails so as to free them from bacteria, as well as how to live in general a healthy, vigorous life, and it was a part of the soldier's routine to carry out these instructions in every particular. As a

result of this system the medical officer was not obliged to treat cases of dysentery and fevers that follow the use of improper food and the neglect of sanitation. During six months of terrible fighting and exposure in a foreign country there was only a fraction of 1 per cent. of loss from preventable disease."¹

It may be true that vehicles other than water, particularly dust and flies, convey the infection in enteric fever, diarrhoea, and dysentery, but much can be done by safeguarding the water supplies.

Diminishing the incidence of these diseases by any means whatever and the subsequent incidence of the disease will naturally be lessened—cases beget cases.

It may or may not be practicable to sterilise the drinking water for a big army in the field, but in camps and in small campaigns such as our "little wars" on the Indian frontier, and in Africa, a great deal more could be done than has been done. Thus in the Tochi Valley, in 1897, a force of some 4000 men was condemned to inactivity and suffered severely from diarrhoea, dysentery, and enteric. The British troops averaged an annual strength of 622, and among them there were 59 cases of enteric with 30 deaths, 371 cases of dysentery with 65 deaths, and 211 cases of diarrhoea with 10 deaths. Here was an ideal instance in which sterilisation of the water or distillation for the sick (as the water was very saline) could have been carried out, as there was plenty of fuel, and the extra cost involved would probably have been more than covered by the saving in pensions, &c. Lieut. Nesfield, I.M.S., in the Tibet campaign used his iodide iodate tablets (see NATURE, July 27, p. 303, and August 31, p. 432), with the result that of 700 men who drank water sterilised with them, none contracted cholera, while of other batches of men passing through the same region a few days later an average of 3 per cent. contracted cholera.

There can be no question that the medical officers of our army are a devoted body of men, highly trained, and fully alive to what should be done, but they are too few adequately to cope with the problem of prevention, and what is more they receive little encouragement in this direction from those in authority. In addition, a body of intelligent trained non-commissioned officers and men, a sanitary corps, is required to carry out the policy of the medical officers. At present guards for the water supply and similar purposes are drawn from the ordinary strength of the regiments, with, of course, no special training. In the China Relief Expedition in 1900 the Japanese provided three skilled men to take care of their sick and wounded for every two provided by the other armies. In olden times it was thought cheaper to obtain a new soldier than to cure a sick or wounded one; the reverse is the case nowadays if the authorities would but appreciate it, and prevention is even better than cure.

R. T. HEWLETT.

NOTES.

WE announce with deep regret that Sir J. S. Burdon Sanderson, Bart., F.R.S., late Regius professor of medicine in the University of Oxford, died at Oxford on November 23.

PROF. EMIL WARBURG, president of the Reichsanstalt in Charlottenburg, and Prof. Henri Moissan, of the University of Paris, have been elected corresponding members of the Academy of Sciences of Munich.

THE twenty-first anniversary of the Royal Scottish Geographical Society was celebrated by a dinner in Edinburgh on Monday, November 27. Prof. J. Geikie, the president of the society, presided.

¹ Lieut.-Col. Firth, R.A.M.C., *Journ. of Hygiene*, Sept., 1905, p. 543.

¹ *Brit. Med. Journ.*, 1904, ii. p. 1332.

THE death is announced of Dr. James Monckman on November 18, at the age of sixty-three. In 1879, after acting as honorary assistant to Prof. J. J. Thomson at Cambridge, Dr. Monckman received the degree of D.Sc. of London University. At Bradford he acted occasionally as consulting analytical chemist, and he carried out some researches in chemistry, as well as work in geology and botany. He assisted in the formation of the Bradford Scientific Society, and was thrice elected its president.

A DISTINCT earth tremor occurred in Manchester and Salford about 3.45 a.m. on November 25. Many people dwelling on the north-west side of the city and borough reported that they were disturbed from sleep by violent shaking of their rooms and the ringing of bells. Some persons reported that they heard a loud thud; others that there was nothing but one violent shock, followed by a tremor lasting several minutes. In the Seedley district of Salford some chimney stacks were displaced, but there was no other damage.

DR. F. AMEGHINO seems to be impressed with the idea that Argentina is the "centre of the universe," and that almost every group of mammals may be traced back to a South American ancestor. In the third of three papers dealing with the presence of a perforation in the astragalus of several groups of mammals, published in vol. xiii. of the *Anales* of the National Museum of Buenos Aires, he gives, for instance, a phylogeny in which both pangolins (Manidae) and aard-varks (Orycteropodidae) are placed as being derived from armadillos (Dasypodidae). A more unsound pedigree it would be almost impossible to invent. Dr. Ameghino has detected the above-mentioned foramen not only in *Orycteropus*, but also in *Canis*, *Tyotherium*, and certain mammals from the Middle Miocene of France.

AMONG the contents of the November issue of the *Naturalist* is a communication by Mr. A. Whitaker on the breeding habits of British bats. Unfortunately, the author's attempts to rear bats in captivity have been only partially successful, in some degree owing to the circumstance that it was not ascertained until too late that a female specimen was pregnant. One noctule bat gave birth, however, to an offspring almost immediately following its capture, and it was noticed that the squeak of the "baby" was even more high-pitched than that of its mother. When the young one was eleven days old (and still blind and naked) the parent escaped, but apparently returned and carried away her offspring. Neolithic remains from the Durham caves form the subject of a paper by Mr. C. T. Trechmann in the same issue.

ACCORDING to *Museum News*, No. 4, the Brooklyn Museum, which is in the van of progress, has been trying the experiment of placing, for the use of visitors, books relating to the subject of the specimens exhibited on tables alongside the various cases. So far the experiment seems to have been a decided success, but whether it could be repeated in this country may be doubtful. Apropos of descriptive labels in museums, it is stated in the same periodical that if ninety-nine objects are labelled and the hundredth is not so treated, visitors will pass over all the former and inquire for the label for the latter. Again, a visitor has been known to look at a label some six feet long, inscribed in letters three inches high "Atlantic Right Whale," and then turn round and ask the nearest official "what that animal is called"!

No. 25 of the "North American Fauna," issued by the U.S. Department of Agriculture, consists of an account of the biological survey of Texas which has been recently

carried out. This part, which is by Mr. V. Bailey, deals, however, only with the determination of life-zones, and the reptiles and mammals, the birds being reserved for a future issue. The economical aspect of the subject has claimed a large share of the attention of the workers, especially as regards the suitability or otherwise of particular crops to particular climatic zones. The mapping of these zones—which are necessarily also life-zones—cannot fail to be of advantage to agriculturists, for "as a crop becomes an established success in one locality, a study of the zone-map will show over what adjoining county it can be profitably extended." Of the nine new mammals described, all but one are subspecies, thus showing how thoroughly the country has been worked.

DR. FORSYTH MAJOR has favoured us with a copy of an interesting and important paper from the October and November numbers of the *Geological Magazine* on certain rodents from the Pleistocene of the western Mediterranean countries. He first of all deals with the picas, or "mouse-hares," of the extinct genus *Prolagus*, which, instead of being confined to Sardinia and Corsica, is also continental, and extends as far west as Spain. Next it is shown that Hensel's *Mus orthodon*, which has been supposed, apparently owing to a misconception, to be akin to *M. sylvaticus*, represents a genus—*Rhagamys*—by itself. It has, for instance, tall-crowned molars with very thick enamel, and nearly vertical tubercles, which when worn present a characteristic pattern. Finally, the Pleistocene *Arvicola henseli* is shown to form a kind of connecting link between the Pliocene *Mimomys*, in which the molars are rooted, and modern voles, the dentine surfaces of the prisms of the latter being incompletely separated.

RECENT miscellaneous results of the work of the U.S. Bureau of Entomology are summarised in Bulletin No. 54 of that section of the Agricultural Department. One article is devoted to the sugar-cane beetle (*Ligyris rugiceps*), on which a special investigation was undertaken last year, owing to the fact that the insect, and the best means of checking its ravages, had received practically no attention for the last five-and-twenty years. It is hoped that the remedies suggested will be found efficient by southern planters. "Conchuella," a Mexican cotton-pest, which it is feared may spread to Texas, has also received attention at the hands of the bureau's officers, while the demonstration of the efficiency of cold storage for "cow peas" (so largely used as fodder and for the improvement of the soil in the States) as a protection against the attacks of the three species of weevils to which they are subject may be regarded as a triumph for the bureau.

WE have received from the trustees a copy of "A Guide to the Fossil Reptiles, Amphibians, and Fishes in the Department of Geology and Palæontology in the British Museum (Natural History), Cromwell Road," issued at the price of sixpence. Although on the title-page merely stated to be the "eighth edition," this excellent little handbook has been entirely re-written by Dr. A. Smith Woodward, the keeper of the department, whose name is a sufficient guarantee that it is thoroughly up to date, and at the same time lucidly and simply written. In its new form it constitutes a brief, popular introduction to the study of the extinct representatives of the groups to which it is devoted. The most striking illustration is one of Mr. Carnegie's dinosaur, *Diplodocus*, which from considerations of space has been mounted in the gallery mainly devoted to recent reptiles, instead of among its fellow monsters. The plate of the skulls of two of the wonderful extinct horned tortoises—one from Queensland and the other from Patagonia—likewise merits a word of commendation.

MR. WINSLOW AND MISS ROGERS have suggested a new classification of the bacterial family Coccaceæ (*Science*, xxi., No. 539, p. 669). The family is divided into two sub-families, the Paracoccaceæ and Metacoccaceæ, the former being subdivided into two genera, *Diplococcus* and *Streptococcus*, the latter into three genera, *Micrococcus*, *Sarcina*, and *Ascococcus*. We are not sure that this revised classification is a material improvement on the classifications which already exist. For instance, the *Pneumococcus* is included among the *Diplococci*, but culturally it is unquestionably a short *Streptococcus*, and in the sputum may occur in chains of four elements.

ALTHOUGH yams, the tubers of species of *Dioscorea*, are extensively cultivated in the West Indies and the tropics of South America for domestic consumption, their value as a food does not appeal to the Ceylonese, who show a preference for the less tasty and less nutritious imported potato. In the Circulars (vol. iii., No. 1) of the Royal Botanic Gardens, Ceylon, Mr. H. F. Macmillan has written some notes on *Dioscoreas* with the object of directing attention to their value as a vegetable, and also to assist cultivators in identifying the different varieties.

THE members of the Scottish Antarctic Expedition were prevented by stress of weather from making a complete exploration of Gough Island, so that the collection of plants obtained by Mr. R. W. Brown, and described in vol. xxxvii. of the *Journal of the Linnean Society*, is probably incomplete. Of the phanerogams and ferns, numbering twenty-seven, the most conspicuous were *Phyllica nitida*, a tree characteristic of the Tristan da Cunha group, tussac-grass, *Spartina arundinacea*, and the tree fern *Lomaria Boryana*. The flora is very similar to that of Tristan da Cunha, but two endemic species, a *Cotula* and an *Asplenium*, were obtained.

At the recent Colonial Exhibition held in the Crystal Palace, of the West Indian colonies Jamaica took the foremost place, receiving, amongst other distinctions, the gold medal presented by the West Indian Cable Company for the best collective exhibit. Of Jamaica produce, oranges and bananas are both much in evidence; the sugar and rum industries are prospering, while the cultivation of cacao, rubber, cotton, and tobacco are all more or less suited to the climate. In the *Agricultural News* (October 7) mention is also made of a tea plantation of 90 acres that promises well under the careful management of the owner, Mr. H. E. Cox. This and a plantation in Carolina, U.S.A., are said to be the only tea plantations in the western hemisphere.

MR. D. E. HUTCHINS, conservator of forests, Cape Town, presents an admirable survey of the past history and present condition of forestry in South Africa in the recent record of "Science in South Africa." The institution of a forest department in Cape Colony dates from 1881; since that time three-quarters of a million pounds has been expended, and the staff now numbers no less than 110 conservators and foresters. Yellow-wood furnished by two species of *Podocarpus*, the most widely spread indigenous timber trees, is not so valuable as the Clanwilliam cedar, *Callitris arborea*, which takes the place of Baltic pine; this cedar having been cut out in the past, future supply is dependent upon the timber that is now being raised in the Cedarberg country. Of exotic trees, species of *Eucalyptus* and *Cupressus* have been largely introduced for timber, and wattles for the production of tan bark.

NEARLY all parts of the British Islands experienced very severe southerly and south-westerly gales on Sunday last, November 26, which, in connection with the spring tides, occasioned great damage, especially on the west and south coasts, many houses being flooded, while the service in the English Channel was quite disorganised. The weather report issued by the Meteorological Office on Saturday morning notified the approach of an important depression off the coast of Ireland, and the chart for Sunday morning showed that the centre of the storm had already reached the west coast of that country, and that the barometer had fallen 0.7 inch in the last twenty-four hours. In the north-west of England the strongest winds were felt between 10 h. p.m. and midnight, and the gusts reached a velocity of 66 miles per hour; in the south-west of England the velocity was at least 75 miles an hour. At the mouth of the Thames it is estimated that the gusts were at the rate of about 60 miles an hour. Notwithstanding the great damage caused by wind and sea combined, it does not appear that the wind-velocity was so great as in the storm of March last, when a rate of 100 miles an hour was recorded in the south-west of England, and 83 miles an hour in the north-west. By Monday morning the central part of the storm had advanced to the coast of Norway.

IN the Journal of the Meteorological Society of Japan for September will be found a very useful summary (in English) of the rainfall of China and Corea, by Mr. T. Okada. Some years ago Dr. Supan published a valuable paper on the subject in Petermann's *Mitteilungen*, but since that time the number of stations has increased, and Mr. Okada has summarised in a handy form the results for forty stations, mostly on the coasts of China and Corea, for the years 1892-1901. The materials are obtained from observations published by the Zi-ka-wei and Hong Kong observatories, and other sources. In northern China the average annual rainfall is under 40 inches; it increases to the southward, and decreases from the coast towards the interior of the Empire, and in individual years it is subject to large fluctuations. In Corea the annual fall is about 36 inches on the west coast, and is generally more than 40 inches on the east and south coasts. In northern China the wettest months are July and August, and February is the driest month. In southern China the wettest month is June, and the driest December. Tables are given showing the average monthly falls at all stations. The coast of central China has an average of 120 rainy days, southern China 80 days, and northern China 60 days. Heavy rainfall in twenty-four hours is rather rare, but falls of 4 inches frequently occur between April and August. In Corea falls of more than 4 inches in a day rarely occur. There is only one instance of more than 8 inches. A table is given showing the greatest daily falls in each month for all stations.

A REPORT has been received on the use of platinum resistance thermometers in determining the temperature of the air at Helwan, the central Egyptian observatory. The object of the paper is to justify the use of a special form of platinum thermometer invented by the writer of the report (Mr. E. B. H. Wade), in conjunction with Prof. Callendar's electric recorder. Instead of coiling the platinum wires on mica supports, and enclosing them in a solid tube for protection, as in the ordinary recorder, Mr. Wade arranged them in an open manner on a light ebonite frame, somewhat in the form of a gridiron, without any kind of casing, the wire being completely exposed to the air. It is claimed, among other things, that the influences of radiation and the Joule effect are much

smaller in this type than in the ordinary one, that it acts more rapidly in its indications, and that the combined recorder and open thermometer may be standardised in such a way as to require no control readings. The author gives a number of tables which seem to show that the advantages claimed are supported by the results obtained. Specimens of thermograms obtained by the employment of the usual and of the modified type show that the fluctuations are more minute in the latter case. It is also stated that Prof. Callendar has expressed approval of the reasons which have led to the adoption of the modified type of thermometer.

THE *Rendiconti* of the Royal Lombardy Institution, xxxviii., 16, contains a short abstract of the report for 1904 of the meteorological observatory on Monte Rosa, by Dr. Camillo Alessandri. The "Capanna Regina Margherita," of which the first wing was opened in 1893, has from that time onwards been visited by many observers, chiefly in connection with physiological researches, and Prof. Mosso's work in this direction is well known; but it was not until May, 1904, that the Italian Meteorological Office placed Dr. Alessandri in official charge of a meteorological station there. During the short time available up to the date of the report, observations were made of temperature, atmospheric electricity, refraction, and time. The climatic conditions occasion great difficulties with the use of instruments, and the author proves the necessity of devising new forms of instruments specially adapted to these conditions. As a beginning, a new metallic thermometer and a registering electrometer have been described by Dr. Alessandri himself.

THE twentieth Bulletin issued by the Geological Survey of Western Australia (Perth) covers 127 pages, and forms a further report by Mr. A. Gibb Maitland on the geological features and mineral resources of the Pilbara goldfield. It includes full details regarding the Nullagine, Warrawoona, and Marble Bar fields, and is accompanied by coloured geological and mining maps. Special interest attaches to the Nullagine district on account of the occurrence of gold in sedimentary rocks bearing a close resemblance to the auriferous conglomerates of the Witwatersrand. The auriferous deposits of Warrawoona and of Marble Hill are quartz reefs.

AN interesting preliminary report has been issued by the mines branch of the Canadian Department of the Interior on the raw materials, manufacture, and uses of hydraulic cements in Manitoba. It has been drawn up by Mr. J. Walter Wells, and involved an examination of the limestones, marls, clays, shales, and coal deposits of the province. Particulars are added of the cement mills in North Dakota, in Minnesota, and in South Dakota; and much information is given regarding the manufacture of cement from the raw materials available that cannot fail to be of practical value in furthering the cement industry of Manitoba. In that province timber is becoming scarce, and suitable building stone and bricks are expensive. Cement is therefore coming into increasing use in house and farm construction, in railway work, in municipal work, and in factories and mills; and within the last eight years the uses of concrete have been greatly extended by the introduction of iron and steel reinforcements, consisting of skeleton structures so arranged in the concrete masses that rods, bars, wires, and bands help in resisting stresses in tension. A very important application of reinforced cement concrete in Manitoba is the construction of

grain elevators. The various applications of cement in the province are well shown in photographic illustrations accompanying the report.

At the last meeting of the Institution of Mechanical Engineers a paper was read by Dr. H. C. H. Carpenter, Mr. R. A. Hadfield, and Mr. Percy Longmuir on the properties of a series of iron-nickel-manganese-carbon alloys. It constituted the seventh report to the Alloys Research Committee, and formed an interesting continuation of the previous reports presented by the late Sir William Roberts-Austen. The research was carried out at the National Physical Laboratory, the alloys having been prepared by Mr. Hadfield at his works at Sheffield. The alloys contained on an average 0.54 per cent. of carbon and 0.88 per cent. of manganese, and the following percentages of nickel:—A, nil; B, 1.20; C, 2.15; D, 4.25; E, 4.05; F, 6.42; G, 7.95; H, 12.22; J, 15.98; and K, 19.91. The report embodies the results of an exhaustive examination of the mechanical, physical, chemical, and metallographical properties of these alloys. It has previously been shown that an increase in the content of nickel raises the maximum stress and lowers the extension. The present research shows that, so far as industrial products are concerned, a danger limit for nickel content is found at 4½ per cent. when carbon and manganese are present to the extent of 0.44 per cent. and 0.88 per cent. respectively. The brittle zone extends from about 5 per cent. to 16 per cent. of nickel. The report, which covers 102 pages, contains a mass of observations of the greatest scientific interest, and the Institution of Mechanical Engineers is to be congratulated on having promoted a costly research of which the immediate practical value to the engineer is very slight.

WE have received from Mr. A. Gibb Maitland a copy of an interesting paper read by him before the Western Australian Natural History Society on the salient geological features of British New Guinea. The territory was annexed to the Crown in 1888, and in 1901 passed into the possession of the Commonwealth of Australia. The geology presents many points of interest. New Guinea rests upon a submarine bank which has been termed the Melanesian Plateau and is separated from another by an abyss 2000 fathoms deep. The coral formations of British New Guinea are very remarkable. All gradations from reefs only a few feet above the water up to 2000 feet in height were noticed. The reef masses are composed of very hard limestones. Coral fragments do not appear to be very common. The volcanic phenomena present all phases, their products being scattered over almost the whole length of the possession. The various sedimentary rocks are well developed in many portions of the territory, and, so far as at present understood, they comprise:—(1) Kevori grits (post-Tertiary); (2) Port Moresby beds (Pliocene); (3) Boioro limestones (undetermined age); (4) Purari River beds (Cretaceous); (5) Strickland River shales (Jurassic); (6) Tauri limestones (Devonian); and (7) metamorphic rocks and crystalline schists. The last named are of considerable economic importance in that they form the original matrix of those deposits that have yielded, from 1888 to 1904, alluvial gold to the value of 255,115*l*. Fragments of coal have been met with in the Purari River beds. It is believed that the formation must attain a thickness of 3000 feet, which would leave room for the intercalation of coal seams. Should a coalfield exist it might exercise a great influence on the future of the possession.

AN interesting paper on the linear force of growing crystals is contained in the *Proceedings of the Washington Academy of Sciences* (vol. vii. p. 283); the authors, Messrs.

G. F. Becker and A. L. Day, direct attention to the fact that in the study of ore deposits occurrences are observable in which crystals have exerted a very considerable force. Pyrites, for example, is formed in slate in such a way as to drive apart the laminae of the rock without any perceptible deformation of the crystals occurring. A description is given of some experiments performed in order to determine the lifting force exerted by crystals of alum growing in a saturated solution whilst subjected to the pressure of a heavy weight. Under the title "An Interesting Pseudosolid," the same authors contribute an account of some investigations of the behaviour of fresh white of egg beaten into a fine foam with an equal volume of powdered sugar. Cylinders of uniform size were cut out of the mass of foam and subjected to compressive or tensile stress, the changes in the dimensions being carefully observed. A series of photographs of the entire foam cylinder after successive increments of compression was made, and then, by superposing the plates, accurate traces of the path of each component particle were obtained. The authors consider that the results obtained offer a confirmation of Prof. J. J. Thomson's theory of solids.

MR. WILHELM ENGELMANN, of Leipzig, has published a fourth, revised edition of Prof. P. Groth's "Physikalische Krystallographie und Einleitung in die krystallographische Kenntnis der wichtigsten Substanzen." The third edition of Prof. Groth's famous book was the subject of an article in our issue for January 30, 1896 (vol. liii. p. 289). Many students of crystallography will welcome the present edition.

A SECOND edition of Dr. F. Mollwo Perkin's "Qualitative Chemical Analysis, Organic and Inorganic," has been published by Messrs. Longmans, Green and Co. The first edition was reviewed in our issue for August 22, 1901 (vol. lxiv. p. 397); and all that need now be said is that more theory has been introduced, the portions dealing with the analysis of acids and the treatment of the substance to be analysed have been recast, and several additions have been made, those in organic analysis being specially intended for university and pharmaceutical students.

A SIXTH edition, revised and enlarged, of Prof. R. Wiedersheim's "Vergleichende Anatomie der Wirbeltiere" has been published by Mr. Gustav Fischer, of Jena. An English edition, founded on the third German edition, was reviewed in NATURE for September 1, 1898 (vol. lviii. p. 409). It is only necessary to state here that this standard work continues to grow in bulk; for instance, the bibliographical appendix, which in the English edition referred to runs to some ninety pages, occupies in the new edition nearly 140 pages.

MR. AKSEL G. S. JOSEPHSON, of the John Crerar Library, Chicago, has sent us a copy of a pamphlet in which he puts forward a proposition for the establishment of a bibliographical institute. Mr. Josephson maintains that as there are laboratories for chemical, physical, and hygienic research, there should also be an institute for conducting bibliographical research, where records of literary productions would be made systematically, and to which persons desiring information of a bibliographical character could turn with their inquiries. Such an institute, he remarks, organised as a bureau of scientific information, would be a boon to all investigators. The institute should be established on an international basis, and its function should be to record, classify, and evaluate printed literature. It should be part of the regular duty of the staff of the institute to index the society publications which are not

included in existing indexes to periodical literature. Bibliographies of special subjects should be prepared to fill existing gaps. To establish such an institute on a reasonably permanent basis would, Mr. Josephson estimates, require an endowment of at least 200,000l.

OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL OCCURRENCES IN DECEMBER:—

- Dec. 2. 5h. Saturn in conjunction with Moon (Saturn $1^{\circ} 21'$ S.).
- „ 3. 10h. 49m. Minimum of Algol (β Persei).
- „ 6. 7h. 38m. Minimum of Algol (β Persei).
- „ 8. 5h. 35m. to 6h. 43m. Moon occults μ Ceti (mag. 4.4).
- „ 9. 4h. 49m. to 5h. 43m. Moon occults f Tauri (mag. 4.3).
- „ 9. 5h. 48m. to 7h. 21m. Transit of Jupiter's Sat. III. (Ganymede).
- „ 10. 4h. 58m. to 5h. 56m. Moon occults γ Tauri (mag. 3.9).
- „ 10. 14h. 52m. to 15h. 53m. Moon occults α Tauri (mag. 1.1).
- „ 10. Saturn. Major axis outer ring = $38'' 34$. Minor axis = $7'' 31$.
- „ 10-12. Epoch of December meteors (Geminids, Radiant $108^{\circ} + 33^{\circ}$).
- „ 15. Venus. Illuminated portion of disc = 0.970. Of Mars = 0.900.
- „ 16. 9h. 5m. to 10h. 41m. Transit of Jupiter's Sat. III. (Ganymede).
- „ 19. 19h. 53m. to 21h. 2m. Moon occults γ Virginis (mag. 3.0).
- „ 22. 0h. Sun enters Virgo. Winter commences.
- „ 23. 12h. 26m. to 14h. 6m. Transit of Jupiter's Sat. III. (Ganymede).
- „ 25. 16h. Mars and Saturn in conjunction (Mars $0^{\circ} 30' N.$).
- „ 26. 7h. Uranus in conjunction with the Sun.
- „ 26. 9h. 21m. Minimum of Algol (β Persei).
- „ 29. 6h. 10m. Minimum of Algol (β Persei).
- „ 30. 20h. Neptune in opposition to the Sun.

COMET 1905b.—The observation of comet 1905b at Bamberg on November 18 was made by Prof. Hartwig, who, in addition to determining the position given in these columns last week, recorded that the magnitude of the comet was 7.5, that the object was round with a diameter of $10'$, and that the central nucleus had a magnitude of 11.0.

An observation made by Prof. Aitken at the Lick Observatory on November 18 gave the comet's position, at 8h. 17m. 31s. (Mount Hamilton M.T.), as

R.A. (app.) = 0h. 33m. 54.4s., dec. = $+77^{\circ} 17' 26''$.

The appearance and the rapid apparent movement of this object seem to point to its comparative proximity to the earth (*Astronomische Nachrichten*, No. 4055).

The following elements and ephemeris, which have been computed by Herr M. Ebbl from the observations of November 18, 19, and 20, are given in Circular No. 80 of the Kiel Centralstelle:—

Elements.

T = 1905 October 27.4926 (Berlin M.T.).

$$\begin{aligned} \omega &= 135^{\circ} 38' 7'' \\ \Omega &= 223^{\circ} 45' 4'' \\ i &= 138^{\circ} 54' 6'' \end{aligned} \quad 1905.0$$

$$\log q = 0.02626$$

Ephemeris 12h. (Berlin M.T.)

1905	a			δ			log Δ			Bright- ness
	h.	m.	s.	h.	m.	s.				
Dec. 2	...	23	30	49	...	$+1^{\circ} 11' 8''$...	9.7150	...	0.20
6	...	23	30	49	...	$-4^{\circ} 46' 6''$...	9.8163	...	0.12
10	...	23	31	28	...	$-8^{\circ} 36' 1''$...	9.9002	...	0.08

Brightness at time of discovery = 1.0.

An observation made at Bamberg on November 21 gave corrections of $-32s.$ in R.A. and $+4'.1$ in declination to the above ephemeris.